Botanical Bulletin.

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HOW TO APPLY PRESSURE IN MAKING BOTANICAL SPECIMENS.—The use of "large stones, especially if roped round to give easy hold, or a few strong boxes filled with sand leave nothing to be desired"—by fine young fellows who delight in working off their superfluous energies; but for those of us who have reached the "shady side of forty" with no such surplus vitality to spare, the substitution of some mechanical device which will obviate the laborious lifting of heavy weights, becomes desirable. Simple screw presses are objectionable, especially in the hands of beginners. "The pressure is deceptive and apt to be far too great at first, yet from the nature of the instrument does not follow the contraction of the pile as its moisture escapes." (Mac Owan.) In order to hit that happy medium *between press and squeeze*, essential to the preparation of a first rate specimen we must *know how much pressure* we are applying and it must be increased (at any rate not diminished) as the plant dries. We have had in satisfactory use for several seasons, a press so constructed that the platform which supports the pile of driers will yield under just the amount of pressure which we wish to give, thus precluding the possibility of excessive pressure and at the same time obviating all the objections to the use of a screw. The simplest arrangement for this purpose is that of a beam resting upon a fulcrum with the platform at one end and the necessary weight at the other. A screw is fixed several feet above the platform. In using place your pile of driers and plants on the platform and apply pressure with the screw until you sink the platform two or three inches. You thus *measure your pressure for it can not be greater than the counterpoise*, and what is of more importance as your pile contracts the platform will *follow it up* with a uniform pressure. Specimens recently gathered will be conveniently placed on the top where they will receive the pressure of the counterpoise, *minus the weight of the pile of driers* and afterwards towards the bottom where the pressure is greater. Non-essential contrivances for carrying out the plan must be left to the ingenuity of any person constructing such a press. Of course it is only the industrious collector at a permanent station who will want anything of the kind. Where only a few hundred specimens are to be made during the summer, stones will answer every purpose.—M. S. B.

SOME INDIANAPOLIS NOTES.—We have anticipated spring by a week of Maple blossoms, and *Cardamine rhomboidea*, var. *purpurea*, in full flower on the 24th ult. The Silver-Maples have, however, been crazy for a month and been frozen several times for their temerity. The White Poplars hung out their "caterpillars," as John Burroughs aptly calls them, to the wind last week and are sorry for it to-night, I warrant. The robins, blue-birds, meadow-larks and red-wings have set their noses northward with force enough to stop a glacier, and so doubtless we may expect to play before many weeks.

I notice that a contributor to FOREST AND STREAM, Wm. Seaman, speaks of *Anacharis Canadensis*, Planchon, as decaying readily in the aquarium and thus in two instances killing the fishes. After six months experience with it I rise to its defense. A more satisfactory plant I never hope to have. By clipping the main stem, the lateral shoots thrive, take root and our only complaint of it is that it

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grows so vigorously that we are called upon every few weeks to destroy many fine plants. I prefer it to any plant I know for under water growth.—HEBERT E. COPELAND, *February 28th.*

LIST OF HEPATICÆ GROWING IN OHIO.—

Sarcoscyphus sphacelatus, Nees.
Plagiochila macrostoma, Sullivant.
" *porelloides*, Lindenberg.
" " var. No. 7b, Aust. Hepat.
" *asplenoides*, N. & M.
Scapania nemorosa, var. 1. Nees. Aust. Hep. No. 16.
" " var. 3. Sull. Musc. Allegh. No. 226.
" *albicans*, Mitten., var. *taxifolia* Minor, Aust. Hep. No. 23.
Jungermannia hyalina, Lyell.
" *crenulata*, Smith.
" *crenuliformis*, Austin.
" *excisa*, Dickson.
Cephalozia Sullivanti, Aust., Hep. p. 13.
" *catenulata*, Huben.
" *connivens*, Dickson.
" *curvifolia*, Dickson.
Odontoschisma Sphagni, Dicks. (Dum.)
" *Hubeneriana*, Rabenhorst.
" *scutata*, (Web.) Austin.
Liochlæna lanceolata, Nees.
Lophocolea heterophylla, Nees.
" *minor*, Nees.
" *Macouni*, Austin, Hep. p. 17.
Chiloscyphus polyanthos, Corda.
" " var. *rivularis*, Synop. Hep. p. 188.
" *ascendens*, Hook. & Wils.
Geocalyx graveolens, Nees.
Calypogeia Trichomanis, Corda.
Lepidozia reptans, Nees.
Mastigobryum trilobatum, Nees.
" " var. 1. Aust. Hep. No. 78.
Trichocolea Tomentella, Nees.
Blepharozia ciliaris, Dumort.
Blepharostoma trichophyllum, Dumort.
Radula complanata, Dumort.
" " var. *minor*, Aust. Hep. No. 86.
" *obconica*, Sullivant.
Madotheca platyphylla, Dumort.
" " var. *navicularis*, Nees. Aust. Hep. No. 90.
" *rivularis*, Nees.
" *Porella*, Nees.
Phragmicoma clypeata, Sull. Musc. Allegh. No. 271.
Lejeunia cavifolia, Lind.
" *echinata*, Taylor.
Frullania squarrosa, Nees.
" *œolotis*, Nees.
" *Eboracensis*, Gottsche.
Steetzia Lyellii, Lehm.
Pellia epiphylla, Nees.
Blasia pusilla, Linn.
Aneura pinguis, Dumort.
" *sessilis*, Sprengel.
" *palmata*, Nees.
Metzgeria furcata, Nees.
Anthoceros punctatus, Linn.
" *lævis*, var. *minor*, Austin.
Notothylas melanospora, Sull.
" *valvata*, Sull.
Lunularia vulgaris.
Marchantia polymorpha, Linn.
Conocephalus conicus, Dumort.
Asterella hemisphærica, Beauv.
Fimbriaria tenella, Nees.
Riccia natans, var. *terrestris*, Aust.
" *lutescens*, Schwein.
" *fluitans*, Linn.
" " var. *terrestris*, Aust.
" *Frostii*, Austin in Bull. Torr. Bot. Club., detected in Painesville in 1874, in Rocky Mts. in 1873.—DR. H. C. BEARDSLEE, *Painesville, O.*

FERNS NEAR HANOVER, IND.—While classifying my botanical collections of the last season I was pleased to find so many ferns among them, and as the Cryptogamic Botany of Southern Indiana has received but little notice as yet, we have thought to interest the readers of the BULLETIN by making a few notes in this department. Early in July while rambling among some of the limestone cliff rocks of the Ohio River, we secured our first specimens of *Asplenium Ruta-muraria*, L., in beautiful fruit; and since then we have visited the same region every month in order to confirm our observations as to its being an evergreen, and we are now fully convinced of the accuracy of our former remarks upon this point. Associated with this species and fruiting abundantly at the same time, we found quite a growth of *Woodsia obtusa*, Torr., but by the end of August it had entirely withered

away. Its fruiting season begins here probably early in June. *Adiantum pedatum*, L., also appears in fruit early in July and continues on into the fall. It is quite common on the shaded parts of the river hills and at a height of about 175 to 200 feet. We have also observed its occurrence in some of the rich thickets. This apparent growth within a certain range of height is quite marked here in at least another species, *Pellæa atropurpurea*, Link., which occurs all along the river cliffs and with a few straggling exceptions which are the result of the disintegration of the upper rocks, is confined to a range on the topmost rocks little, if at all, exceeding 30 feet in vertical height. Of the genus *Asplenium* we will simply mention the species *A. angustifolium*, Mx., *A. thelypteroides*, Mx., and *A. Filix-fœmina*, Bernh., which were mentioned at some length in a previous number of the BULLETIN. *Camptosorus rhizophyllus*, Link., is abundant upon most of our shaded and moss-covered rocks, both in the neighborhood of the river and along the banks of our larger creeks. Its luxuriance is a marked feature of the broken rocks in the valleys running into the Ohio. We have noticed some striking variations in the character of the basal lobes of the frond, in one of which these lobes are prolonged out from the rhachis on each side from an inch to an inch and a half into a long linear tip. *Phegopteris hexagonoptera*, Fee, appears sparingly, during late summer and fall, in the richer and rolling woodlands and generally along the banks of small streams.—(*To be continued in May number.*)

SOME ALPINE PLANTS FOUND ON MT. LINCOLN, COLORADO.—A botanist who has never ascended a mountain peak in midsummer and seen its wonderfully rich and varied flora, has a treat before him which others may well envy. A word description falls so far short of the reality that it does not seem to convey any correct idea of the beauty and brilliancy of alpine flowers. They are found growing in profusion on most mountain heights, covering with beauty the grassy slopes on the rocky declivities from timber-line to the very summit. Nothing on the plains can approach in rich and delicate beauty these children of the mountain tops, chilled every night to freezing and drawing their nourishment from the just melted snow. The writer was never more delighted with an alpine flora than when he made an ascent of Mt. Lincoln, in Colorado, a peak considerably over 14,000 feet in height. The ascent was made on July 9th, 1873, a highly favorable time to see mountain plants in all their glory. Late the evening before we had encamped at timberline, which is, in Colorado, from 11,000 to 12,000 feet elevation. This timberline is determined by the lying of the snow in spring. Of course the highest tree growth is evergreens, which are curiously knotted and twisted by the weight of the winter snow. Early we commenced the climb and every step in advance brought us to new beauties, and long before the summit was reached our portfolios were groaning with treasures which neither love nor money nor fatigue could have induced us to throw away. Time or space will not permit me to enumerate half the plants I secured that day, but I will mention a few of the most prominent.

We had not gone ten yards from camp when we found ourselves amongst thick clumps of *Pentstemon glaucus*, Grah., with its dense clusters of very dark purple flowers. Near by were growing the two *Polygonaceæ* always found in the Rocky Mountains, *Polygonum Bistorta*, L., var. *oblongifolium*, Meis., bearing its large dense spike of white flowers, and *Oxyria digyna*, Campd. We also secured three or four specimens of the delicate little *Adoxa Moschatellina*. L., exhaling its faint musky odor. All along the slopes were growing the blue *Mertensia alpina*, Don., and the darker blue *Polemonium confertum*, Gr. with its crowded and musk-scented clusters of flowers. The *Anemones* were out in profusion of numbers and species, flashing at us everywhere with their large and various colored flowers. There were *Anemone patens*, L., var. *Nuttalliana*, Gr., *A. parviflora*, Mx., *A. multifida*, DC., by far the most common and brilliant, and the rarer *A. narcissiflora*. L., with its solitary white flower. *Thalictrum Fendleri*, Eng., was also growing in great profusion along with *Ranunculus adoneus*, Gr., the most showy species of the genus. Its

flowers are solitary, golden yellow and often an inch in diameter. Any one traveling and camping in the mountains will soon become acquainted with *Caltha leptosepala*, DC., as it is a most excellent pot-herb and many a case full have I carried in to camp to be used at our next meal. Its flowers are large and beautiful but always look as if they were about chilled to death. There is always a tinge of blue, especially on the underside of the white petals. *Trollius laxus*, Salisb. is always associated with the last, but its flowers are various shades of yellow and look more in keeping with the frosty air. The *Drabas* are also well represented. There are the yellow flowered *Draba alpina*, L., *D. aurea*, Vahl. and *D. streptocarpa*, Gr., with its curiously twisted silicles. The white flowered *D. nemorosa*, L., var. *alpina*, Porter, occurs quite abundantly at 12-13000 feet elevation. The little golden flowered *Cymopterus alpinus*, Gr., is found growing every where on the mountain tops. Two beautiful little *Erigerons* were found growing at 13000 feet altitude; *E. compositum*, Pursh., having a scape 2-6 inches high and rays white, pink or blue, and *E. uniflorum*, L., growing 3-6 inches high, its large solitary head surrounded by a very woolly involucre, the wool generally being deep purple. At about 13000 feet elevation we came across a patch of flowers I never shall forget. It was a level, grassy spot, saturated with the just melted snow-water and well protected from chilling blasts. The ground was absolutely covered with brilliant bloom and it seemed as if every color in the rainbow was represented. Never have I seen, in the best kept gardens, such a rich display. There was a sparkling freshness and freedom about it we never can get into green houses. The first to attract my notice, because the largest, was the showy *Primula Parryi*, Gr., having its dense cluster of fleshy root leaves and bearing on its long scape a cluster of rose-colored flowers. Close to it was its more humble relative, *P. angustifolia*, Torr., a most exquisite little *Primula*, bearing a single purple flower and running up the mountains to 14000 feet. Then I noticed the flowers that contributed the yellow to the scene. First and foremost was the splendid *Actinella grandiflora*, T. & G. with a scape 6-9 inches high and densely white woolly from top to bottom. Its large solitary heads seemed half as large as the whole plant and were frequently three inches broad. Then there was its smaller relative, *A. aculis*, L., with a naked scape 1-6 inches high and smaller flowers. Then there were two *Sedums* giving shades of purple, rose and white. They were *S. Rhodiola*, DC., with its dark purple fertile heads and greenish sterile heads and *S. rhodanthum*, Gr., bearing rose-colored or white flowers. Then there was *Geum Rossii*, Seringe, with golden yellow petals and the little rose-colored *Calandrinia pygmæa*, Gr., which also runs far up the mountains. Then I noticed three species of *Saxifraga*, viz: *S. cernua*, L., with small white or cream-colored flowers and bearing little bulbs in the axils of its upper leaves; *S. flagellaris*, Willd., with large yellow flowers and stolons striking out in every direction from its cluster of root leaves; and *S. punctata*, L., with white petals and a tall naked scape. Then high up on the mountain, at 14000 feet altitude, came the little moss-tufted flowers, crouching down close to the ground to escape as much as possible the freezing winds, but brilliant nevertheless. There was the purple-flowered *Silene acaulis*, L., or Moss Campion, familiar to visitors in the White Mountains. It clung to these high slopes in large bunches and made great mats of purple. We saw also two *Claytonias*, viz: *C. Caroliniana*, Mx., var. *lanceolata*, Watson, and *C. arctica*, Adams, var. *megarhiza*, Gr. with its great purple tap root running deep into the rocks and its scape bearing delicate white flowers penciled with pink lines. No less than four *Trifoliums* lent their beauty to these great heights. They were *T. longipes*, Nutt., the beautiful little dark purple, half opened *T. nanum*, Torr., the delicately shaded *T. dasyphyllum*, T. & G., and the large headed, rose purple *T. Parryi*, Gr. No flower was prettier than the densely matted, violet blue *Oxytropis Uralensis*, L., var. *pumila*, Ledeb. The sky blue shade was given by dense patches of *Eritrichium villosum*, DC., var. *aretioides*, Hook., which is called the mountain Forget-me-not. These flowers are to be met upon almost all the mountains in Colorado and well repay the fatigue of climbing.—Ed.